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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,696	12/01/2003	Toshiya Hataguchi	70021172-1	2553

7590 10/19/2005

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EXAMINER	
WYATT, KEVIN S	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,696	HATAGUCHI ET AL.	
	Examiner	Art Unit	
	Kevin Wyatt	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 8/17/2005. These drawings are accepted.

Claim Rejections - 35 USC § 112

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 7, line 4, the term "said stripes" does not specifically state which stripes are illuminated. It should be stated whether stripes of the first track or second track should be illuminated. Also, in claim 7 line 7, the term "said photdetector" should specify whether "first photodetector" or "second photodetector" is used.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Rothamel (U.S. Patent No. 6,639,206 B1).

Regarding claim 1, Rothamel shows in Fig. 1 a drum (7, i.e., rotational portion) comprising a cylindrical surface (5, i.e., rotating cylindrical surface) characterized by an axis (8, i.e., axis of rotation), said drum having a surface with a normal perpendicular to said axis; a first track (9, i.e., strip) comprising a plurality of alternating reflective (2, i.e., reflectors) and non-reflective (11, i.e., lands) stripes arranged on said cylindrical surface; a first light source (1, i.e., emitter) for illuminating said stripes at an opaque angle relative to said normal; and a first photodetector (3, i.e., detector) positioned to receive light from said light source that is reflected from said reflective stripes of said first track when said drum moves relative to said photodetector, said reflective stripes of said first track forming an image of said first light source on said first photodetector (col. 5, lines 7-10).

Regarding claim 5, said cylindrical surface (5, i.e., rotating cylindrical surface) lies between said first track (9, i.e., strip) and said axis (8, i.e., axis of rotation).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Chen (U.S. Patent No. Patent No. 6,817,528 B2).

Regarding claim 2, Rothamel discloses the claimed invention as stated above. Rothamel does not disclose Rothamel does not disclose that said first light source that emits a collimated beam of light. Chen shows in Figs. 1-2 that said first light source (combination of (VCSEL) unit 202 and convex lens (212)) emits a collimated beam of light (collimated beam (222))(col. 6, lines 36-38). It would have been obvious to one skilled in the art to provide the to provide in Rothamel collimated lenses to collimate light rays for each light source for the purpose of maintaining alignment of active lighting area with the area of photodetector during drum rotation.

7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Suganuma (U.S. Patent No. 6,448,996 B2).

Regarding claims 3 and 4, Rothamel discloses the claimed invention as stated above. Rothamel does not disclose that a) said drum rotates about said axis when a shaft is rotated and b) said shaft is coincident with said axis. Suganuma shows in Fig. 1 that a) said drum (14) rotates about said axis when a shaft (18, i.e., axial shaft) is rotated and b) said shaft is coincident with said axis. (col. 8, lines 20-31). It would have been obvious to one skilled in the art to provide the shaft of Suganuma to device of Rothamel for the purpose of rotating the drum of Rothamel.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1).

Regarding claim 6, Rothamel discloses the claimed invention as stated above. Rothamel does not disclose that said first track lies between a cylindrical surface and said axis. It would have been obvious to one skilled in the art to rearrange components of encoder by placing the encoder tracks between cylindrical surface and said axis for the purpose of providing a more compact design.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Karim-Panahi (U.S. Patent No. 5,4338,882).

Regarding claim 7, Rothamel discloses the claimed invention as stated above. Rothamel does not disclose a) a second track comprising a plurality of alternating reflective and non-reflective stripes arranged on said cylindrical surface; a second light source for illuminating said stripes at an opaque angle relative to said normal; b) and a second photodetector positioned to receive light from said second light source that is reflected from said reflective stripes of said second track, wherein said drum moves relative to said photodetector. Karim-Panahi shows Fig. 1 a) a second track (4, i.e., circumferential band) comprising a plurality of alternating reflective and non-reflective stripes arranged on said cylindrical surface (2, i.e., rotating shaft); a second light source (5, i.e., light source) for illuminating said stripes at an opaque angle relative to said normal; b) and a second photodetector (8, i.e., photodetector) positioned to receive light

from said second light source (5, i.e., light source) that is reflected from said reflective stripes of said second track (4, i.e., circumferential band), wherein said drum (2, i.e., rotating shaft) moves relative to said photodetector. It would have been obvious to one skilled in the art to provide in Rothamel the second track of alternating reflective non-reflective stripes, the second light source, and the second photodetector of Karim-Panahi for the purpose of collecting more data on the periodic motion of rotating member.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rothamel (U.S. Patent No. 6,639,206 B1) in view of Karim-Panahi (U.S. Patent No. 5,4338,882), and Cohen (U.S. Patent No. 4,124,839).

Regarding claim 8, the combination of Rothamel and Karim-Panahi discloses the claimed invention as stated above. The combination of Rothamel and Karim-Panahi does not disclose that said reflective stripes of said second track have widths that are different from said reflective stripes of said first track. Cohen shows in Fig. 4 cylindrical drum comprising six encoding tracks (170-180) comprising stripes of varying widths. It would have been obvious to one skilled in the art to modify the combination of Rothamel and Karim-Panahi by placing additional encoding tracks on the cylindrical drum as taught by Cohen for the purpose of providing additional encoding data to the system (column 9, lines 23-27).

Response to Arguments

11. Applicant's arguments filed on 8/17/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that Claim 1 requires that the reflective stripes form an image of the first light source of the photodetector, and that the examiner has not pointed to any such teaching in Rothamel. Examiner disagrees that the reflective stripes form an image of the first light source of the photodetector, and that the examiner has not pointed to any such teaching in Rothamel. The reflective properties of the reflective stripes form a virtual image of the light rays (from first light source) on its surface as they are reflected to the photodetector (it is well known in the art that light rays reflected from a reflective surface forms a virtual image on the object receiving reflected rays).

In response to applicant's argument that since the embodiment discussed in Figure 1 of Rothamel utilizes planar reflectors, this embodiment could not provide the imaging property in question.

Examiner disagrees. The planar reflectors on the surface of the drum ensure that the focal point of the light rays (taken from the light source) lies flat on the surface of the reflective stripes at the precise point when the beam incident on the surface equals the reflected beam during angular rotation (col. 3, lines 21-23). Thus, examiner disagrees that rothamel does not anticipate claims 1 and 5.

In response to applicant's argument regarding claim 2, that the scheme taught in Chen does not image the light sources onto the photodetector.

Examiner disagrees. Chen provides a mixture of images provided by the two

tracks in addition to the image of the light source. Furthermore, it is not necessary for the reference of Chen to image a light source to meet the limitation of claim 2, Chen need only to provide a collimated light source in combination with the teachings of Rothamel.

In response to applicant's argument that no teaching points indicates that the collimator in Chen provides any alignment benefit in the scheme shown in Rothamel. Examiner disagrees. Further clarifying the motivation in claim 2, Rothamel, provides in Fig.1 the active lighting area (2, i.e., reflectors) will provide maximum reflected light to the entire area of photodector (3) if emitter (1) and photodetector are in perfect alignment at a point during drum rotation. Therefore maximum reflected light is converted into a peak voltage signal by photodetector (3). Therefore, the motivation for the combination Chen and Rothamel is appriopriate and examiner disagrees that the combined teachings do not satisfy the limitations of the claim 2.

In response to applicant's argument regarding claim 8, that the tracks of Karim-Panahi must have the same widths so they may produce the same frequency. Karim-Panahi does not teach that the bands that encircle the shaft must have the same width. In fact, Karim-Panahi states in col. 4 lines 2-5 that it is not necessary for the markings on the bands to line up with each other or to be distributed at even intervals. The purpose of the markings are to provide reflected light to the photodetectors so they may provide a train of electrical output pulses to channels A and B of the oscilloscope (col. 4, lines 17-20 and 26-29).

In response to applicant's argument utilizing different spacings will lead to and inoperable device. Examiner disagrees. The device of Karim-Panahi is designed to monitor the phase difference produced between the two bands which represent the two channels (A and B) on an oscilloscope. Figs. 2-3 of Karim-Panahi refer to a train of pulses (markings on the bands). The train of pulses represents a signal which marks the angular velocity Ω (distance of rotation per/time division equivalent to angular frequency (revolutions per/time division)) of the shaft and not counted pulses per/time division (col. 4, lines 21-26). Thus, the two bands produce the same frequency irrespective of the distribution, spacings, or widths of markings on each band. Therefore, utilizing bands with different spacings will not lead to an inoperable device.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571)-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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